



## Simulating adoption of sustainable intensification technologies in semi-arid areas of central Tanzania

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### Abstract

Despite sustainable intensification technologies being the best options for enhancing crop and livestock productivity in many fragile ecosystems, there is limited uptake of these technologies to address challenges to crop and livestock productivity in Tanzania. The study was conducted to simulate adoption of sustainable intensification technologies in semi-arid areas of central Tanzania. ADOPT (Adoption and Diffusion Outcome Prediction Tool) was used to simulate adoption of the farm level technologies tested including improved poultry feeds, improved seeds and agroforestry technologies. Presentations of the technology diffusion results from ADOPT simulation model used the S-shaped function of time. Other useful adoption indicators that were considered were degree of adoption and intensity of adoption. The adoption rate was used since it is largely involved with other farm decisions making tools such as cost-benefit analysis. Results projected adoption peak of improved poultry feeds being 58% and 93% in Mlali and Njoro villages respectively. Further projections show that it would take 10 and 12 years to reach adoption peak in Mlali and Njoro, respectively. The differences on improved poultry feeds adoption level have been associated with closeness of these villages to agro-dealers. A village which is located at approximately 2-5 km from the town centre is favored in terms of being close to agro-dealers hence can easily adopt improved poultry feeds and other agro-inputs related ones. Improved seed has been projected to be easily adopted in Mlali compared to Laikala village of Kongwa district. Adoption peak of 82% would be reached after 8 years in Mlali, whereby, the peak of 68% would be reached in Laikala after 12 years. Proximity of these villages to agro-dealers would facilitate easily adoption of improved seeds. In this regard, farmers would be encouraged to use and test these farm level technologies in combination as package. The adoption rate peaks have been projected to be very high for agroforestry in both villages. However, it would take 9 years to reach adoption peak of 94% and 12 years to reach adoption peak of 90% in Moletli village of Kongwa district. The study recommends integration of promising technologies to enhance adoption and diffusion of technologies through promoting proper use of fertilizers, improved seeds and enhancing rain-water harvesting for drought risk minimization

**Keywords:** production technologies, socio-economic factors, adoption level, simulation

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